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10/822,077	04/09/2004	Sandy Thomson	10360-115001	2186

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EXAMINER

CURS, NATHAN M

ART UNIT	PAPER NUMBER
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2613

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/822,077	Applicant(s) THOMSON ET AL.	
	Examiner Nathan Curs	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-20 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 9 is objected to because of the following informalities: the claim needs an article before "transmit device" in line 11. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites the limitation "a second portion", but there is no mention of a first portion. It's not clear if a first portion is being claimed or not.

Claim 16 recites the limitation "the non-linear processing component" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 18-20 are directed to non-statutory subject matter. The claimed "computer program product" is a data structure. The computer program product "tangibly embodied in an information carrier" does not mean the computer program product is embodied in computer-

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readable media; it could be embodied in another information carrier, such as a signal. Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory. The further limitation "operable to cause a machine to..." does not define a structural and functional interrelationship between the data structure and the other claimed aspects of the invention. See MPEP § 2106.01 [R-5].

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 1, 2, 5-7, 10, 12, 13, 15 and 17-19 are rejected under 35 U.S.C. 102(a) as being anticipated by McNicol et al. ("McNicol") (US Patent Application Publication No. 2004/0067064).

Regarding claim 1, McNicol discloses a method comprising: providing a multi-port memory having a plurality of read ports, each read port including a filter coefficient value representing a dispersion compensation value associated with an optical link and processing an input optical signal using the filter coefficient values in the multi-port memory to generate an output optical signal for transmission on the optical link (figs. 3 and 4 and paragraphs 0042-0049).

Regarding claim 2, McNicol discloses the method of claim 1, wherein the multi-port memory is a nine-port memory having eight read ports (fig. 4, element 26 and paragraphs 0046 and 0047).

Regarding claim 3, McNicol discloses the method of claim 1, wherein processing the input optical signal comprises: receiving the input optical signal, sampling the input optical signal

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to provide an input data stream (paragraph 0027, which indicates an embodiment with O/E conversion before the processing and paragraph 0047 where the latching is a form of sampling), and applying the filter coefficient values to the input data stream to generate one or more output data streams (paragraphs 0046-0049).

Regarding claim 4, McNicol discloses the method of claim 3, wherein applying the filter coefficient values to the input data stream comprises: identifying a first portion of the input data stream as an address to the multi-port memory, retrieving a filter coefficient value from the multi-port memory using the address, and adding the retrieved filter coefficient value to a second portion of the input data stream to generate an output data stream (paragraphs 0046-0048, where each stream of the parallel data stream corresponds to an address of the RAM).

Regarding claim 5, McNicol discloses a digital filter comprising: one or more functional units, each functional unit being associated with a lookup table of filter coefficient values, each functional unit to process an input data stream using the filter coefficient values in the lookup table and to generate one or more output data streams for transmission on an optical link (figs. 3 and 4 and paragraphs 0042-0049).

Regarding claim 6, McNicol discloses the digital filter of claim 5, wherein the lookup table is a multi-port memory having a plurality of read ports, each read port storing a filter coefficient value (paragraphs 0046 and 0047).

Regarding claim 7, McNicol discloses the digital filter of claim 5, wherein each filter coefficient value represents a dispersion compensation value associated with the optical link (paragraph 0042).

Regarding claim 10, McNicol discloses a system comprising: an optical transmission path having one or more optical links, a transmit device including a dispersion compensation filter, the dispersion compensation filter associated with one or more lookup tables storing filter

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coefficient values, each filter coefficient value representing a dispersion compensation value associated with an optical link (figs. 3 and 4 and paragraphs 0042-0049); and a receive device coupled to the transmit device by the optical transmission path, transmit device processes an input optical signal using the filter coefficient values to generate an output optical signal for transmission to the receive device over an optical link of the optical transmission path (figs. 3 and 4 and paragraphs 0042-0049).

Regarding claim 11, McNicol discloses the system of claim 10, wherein the transmit device further comprises: a pre-encoder circuit to receive an input optical signal, sample the input optical signal and generate an input data stream (paragraph 0027, which indicates an embodiment with O/E conversion before the processing and paragraph 0047 where the latching is a form of sampling).

Regarding claim 12, McNicol discloses the system of claim 10, wherein the dispersion compensation filter comprises: one or more functional units, each functional unit for processing a bit of an input data stream (fig. 4 and paragraphs 0046 and 0047).

Regarding claim 13, McNicol discloses the system of claim 12, wherein each functional unit comprises: a linear processing component for processing a first portion of the input data stream to generate a linear component of a final sum representing a bit of the input data stream (fig. 4 and paragraphs 0046-0048).

Regarding claim 15, McNicol discloses the system of claim 12, wherein each functional unit comprises: a non-linear processing component for processing a second portion of the input data stream to generate a non-linear component of the final sum representing a bit of the input data stream (paragraph 0045).

Regarding claim 16, McNicol discloses the system of claim 14, wherein the non-linear processing component comprises: a multi-port memory having a plurality of read ports, each

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read port storing a filter coefficient value, wherein processing the second portion of the input data stream includes using the second portion of the input data stream as an address to the multi-port memory to retrieve a filter coefficient value (paragraph 0045, where the RAM LUT teaching also applies to a non-linear LUT compensator).

Regarding claim 17, McNicol discloses the system of claim 12, wherein each functional unit comprises: a final processing component for generating a final sum representing a bit of the input data stream (paragraph 0048).

Regarding claim 18, McNicol discloses a computer program product, tangibly embodied in an information carrier, the computer program product being operable to cause a machine to: process an input optical signal using filter coefficient values stored in a multi-port memory to generate an output optical signal for transmission on an optical link, the multi-port memory having a plurality of read ports, each read port including a filter coefficient value representing a dispersion compensation value associated with the optical link (figs. 3 and 4 and paragraphs 0042-0049).

Regarding claim 19, McNicol discloses the computer program product of claim 18, wherein the multi-port memory is a nine-port memory having eight read ports (paragraphs 0046 and 0047).

Regarding claim 20, McNicol discloses the computer program product of claim 18 being further operable to cause a machine to: receive the input optical signal, sample the input optical signal to provide an input data stream (paragraph 0027, which indicates an embodiment with O/E conversion before the processing and paragraph 0047 where the latching is a form of sampling); and apply the filter coefficient values to the input data stream to generate one or more output data streams (paragraphs 0046-0049).

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***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over McNicol (US Patent Application Publication No. 2004/0067064) in view of Hazanchuk (US Patent No. 6888372).

Regarding claim 8, McNicol discloses the digital filter of claim 5, but does not disclose that each functional unit further comprises: a linear adder tree to process a portion of the input data stream, the linear adder tree including a plurality of adders, each adder having an input for receiving one of a first input sample value and a second input sample value, and an output for providing a partial sum. However, McNicol does disclose a set of two or more RAM blocks whose outputs are added (paragraph 0048). Hazanchuk suggests adding the outputs of RAM blocks using an adder tree, in the context of a digital filter application (col. 11, lines 19-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an adder tree for adding the outputs of the RAM blocks of McNicol, since Hazanchuk suggests using an adder tree to add the outputs of RAM blocks in the context of a digital filter application.

Regarding claim 14, McNicol discloses the system of claim 13, but does not disclose that the linear processing component comprises: a linear adder tree including a plurality of adders, each adder having an input for receiving one of a first input sample value and a second input sample value, and an output for providing the linear component of the final sum representing a bit of the input data stream. However, it would have been obvious to one of ordinary skill in the



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art at the time of the invention to combine Hazanchuck with McNicol as described above for claim 8.

### ***Allowable Subject Matter***

10. Claim 9 is objected to as described above and for being dependent upon a rejected base claim, but would be allowable if the above objections were overcome and if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter in claim 9: the claimed final adder having an input from the adder tree and a separate input from the lookup table was not disclosed by McNicol or Hazanchuk and a suggestion or teaching to modify the combination for this feature could not be found in the prior art.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- US Patent Application Publication No. 2004/0197103 – discloses transmitter-side processing before E/O conversion to compensate for non-linear effects in optical transmission.
- US Patent Application Publication No. 2005/0008364 – discloses transmitter-side processing before E/O conversion to offset dispersion induced phase changes in optical transmission.

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- US Patent Application Publication No. 2006/0078336 – discloses transmitter-side processing before E/O conversion to compensate for dispersion effects in optical transmission.

13. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pairedirect.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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